REMARKS

Claims 1-127 in this case as filed. Claims 2-47, 49-52, 54-64, 70-77, 80, 81, 85-87, 94, 96-98, 107, 112-115, 118, 122 and 127 have been canceled without prejudice to the subject matter therein in view of the restriction requirement and in order to minimize excess claims fees for the addition of additional claims. This amendment adds new claims 128-177. On entrance of this amendment claims 1, 48, 53, 65-69, 78, 79, 82-84, 88-93, 95, 99-106, 108-111, 116, 117, 119-121, 123-126 and 128-177 are in this case.

Restriction Requirement and Election

Claims 1-127 have been restricted by the Examiner into six groups as follows:

Group I—Claims 66, 68-77, and 92 (and claims 2-88, 90-94, 96-99 and 102-109), drawn to methods of inducing a biological response comprising a multivalent ligand that comprises a molecular scaffold that is a ring opening metathesis polymerization (ROMP) polymer;

Group II--Claims 67, 78-88 and 93 (and claims 2-88, 90-94, 96-99 and 102-109), drawn to methods of inducing a biological response comprising a multivalent ligand that comprises a molecular scaffold that is an atom-transfer radical polymerization (ATRP) polymer;

Group III—Claims 110-117, drawn to a multivalent ligand as in the formula of claim 110;

Group IV—Claim 118 drawn to a library of multivalent ligands as in the formula of claim 110;

Group V—Claims 119-126 drawn to a multivalent ligand as in the formula of claim 119; and

Group VI—Claim 127 drawn to a library of multivalent ligands as in the formula of claim 119.

Applicants traverse the restriction requirement to the extent that it is unclear, based on the explanations given, that it was intended to encompass all of the method claims in Groups I and II. The Examiner has characterized the method claims of Group I and II as directed to methods of inducing a biological response. Applicants note that method claims 89, 95, and 101 are not listed in the above recitation of claims. Claims 90-94, 96-99 and 102-109 which depend from claims 89, 95 and 101, respectively are noted in the above listing as part of the Group I and Group II claims. Claim 89 is directed to a method of enhancing aggregation of biological particles and claim 101 is directed to a method of generating an assembly of biological macromolecules. These methods are related to methods for induction of biological responses of claim 1, but do not depend from claim 1 and do not specifically recite a particular biological response. Assembly or aggregation of biological molecules can be employed for induction of a biological response or for other applications. Applicants request clarification of the restriction requirement with respect to claims 89 and 101 and the claims that depend there from.

In order to respond to the present restriction requirement, Applicants assume that all of these claims (claim 89 and 101 and their dependents) are encompassed in either Group I or Group II dependent upon the type of polymer that is the molecular scaffold for the multivalent ligand. Based upon this assumption Applicants' understanding of the present restriction requirement, Applicants elect the claims of Group II including all of method claims 1-109 to the extent that they are directed to methods employing an atom-transfer radical polymerization (ATRP) polymer. Applicants' election is intended to encompass claims 101-109 wherein the multivalent ligand is an atom-transfer radical polymerization (ATRP) polymer.

The Office Action states that claims 1, 89, 95, 100 and 101 as well as claims 2-88, 90-94, 96-99 and 102-109, link the inventions of Group I and II. This statement indicates that all of method claims 1-109 are in Group I or II dependent upon the identity of the polymer. The restriction requirement is asserted to be subject to the non-allowance of the linking claims. Upon an indication of allowance of the linking claims, the restriction requirement as to the linked inventions shall be withdrawn and any claims depending from or otherwise requiring all the limitations of the allowed linking claims will be rejoined.

The Examiner has in addition required an election of species which is asserted to require an election of (1) ultimate biological response; (2) ultimate biological system; (3) a particular receptor; (4) a signal recognition element; (5) a binding recognition element or functional element or both; (6) covalent or non-covalent bond binding the signal recognition element to the molecular scaffold; (7) a species of molecular scaffold; and (8) an ultimate species of multivalent ligand.

Applicants respectfully traverse the requirement for election. The various species of each generic method claim of Group II are linked by the generic claims 1, 89, 95 and 101 among others. One or more of these generic claims are believed to be allowable and as such the election should be withdrawn.

Applicants elect the following species:
(1) ultimate biological response: immune adherence;
(2) biological system: a biological system comprising an erythrocyte and a species such as an antigen or pathogen which is to be subjected to immune adherence which could be in a system in vitro or in vivo;
(3) receptor: a receptor on an erythrocyte, and more specifically CR1;
(4) signal recognition element: a species that recognizes and binds to a receptor on an erythrocyte and more specifically an anti-CR1 Fab';

(5) a binding recognition element: a species that binds to a pathogen or antigen, including an antibody or fragment thereof and more specifically an anti-pathogen Fab';
(6) type of binding of SRE to scaffold: covalent;
(7) species of molecular scaffold: ATRP polymer which is a methyl acrylate polymer and if necessary wherein the polymer contains one or more maleimide species as in scheme 13; and
(8) ultimate species of multivalent ligand –the species of Example 7 and Figure 21 and as illustrated in Schemes 13 and 14 a maleimide-containing methyl acrylate polymer which carries a anti-*Staphylococcus aureus* Fab" and an anti-CR1 Fab'.

Amendment of the Claims

Claims 2-47, 49-52, 54-64, 70-77, 80, 81, 85-87, 94, 96-98, 107, 112-115, 118, 122 and 127 have been canceled without prejudice to the subject matter therein in view of the restriction requirement and in order to minimize excess claims fees for the addition of additional claims.

New claim 128 is independent and is directed to a multivalent ligand comprising a plurality of signal recognition elements recognized by at least one receptor on an erythrocyte and bonded to a molecular scaffold which is a polymer. This claim is supported in the specification in Example 7 and Fig. 17. New claims 129-138 depend from new claim 128 and are supported in the claims as filed.

New claim 139 depends from claim 119 and is directed to a multivalent ligand wherein the BRE are antibodies or fragments thereof. New claim 139 is supported in the as-filed claims.
New claim 140 depends from claim 119 and specifies that the multivalent ligand contains no metal chelating groups. This claim is supported by various examples, schemes and figures in the specification, e.g., Fig. 17 where certain

multivalent ligands of the invention do not carry chelating groups. New claims 141 to 148 depend from claim 140 and are fully supported by the claim as filed.

Claims 149-177 are directed to methods. Claims 149-156 depend from method claim 1 and all require that the wherein the biological response is immune adherence and the biological system comprises erythrocytes. These claims are consistent with the election of species made above. Claims 157 to 177 depend from claim 101 and are fully supported by the specification and the as-filed claims.

Claims 110 and 119 have been amended to depend from new claim 128. Claims 108 and117 are amended to correct obvious typographic errors.

With respect to the election of species, all of method claims 1, 48, 53, 65, 67, 78, 79, 88-91, 93, 101, 103, 108, 109, 119, 120, 123-126, 128-132, 134-177 read on the elected species.

Conclusion

Clarification and reconsideration of the restriction requirement is respectfully requested. This response is accompanied by a Petition for Extension of Time of Five Months and the small entity fee of $1,080.00. This response cancels more claims than are added and, although one independent claim is added, one as-filed independent claim is made dependent. Thus, no additional fees for excess claims are believed to be due. The United States Patent Office is authorized to

deduct the required extension fees and any fee deficiency from deposit account 07-1969.

Respectfully submitted,

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